

### SECTION III.—FORECASTS.

#### STORMS AND WARNINGS FOR JUNE.

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Storm warnings were displayed on June 6, 23, 26, and 27.

The warnings on the 6th were displayed on the California coast from Point Lobos to Eureka, on account of the approach of a marked storm toward the north Pacific coast. The warnings of the 23d were displayed on the California coast at Eureka only.

On the morning of the 26th there was a storm of well-defined character central over western South Dakota and, after special observations had been called for, northeast storm warnings were ordered on Lake Superior from Duluth to Marquette and on Lake Michigan at Escanaba. The storm continued to move eastward with about the same intensity and on the evening of the 26th southeast storm warnings were ordered on the west shore of Lake Michigan from Green Bay to Plum Island; by this time high northeast winds were blowing over extreme western Lake Superior. On the morning of the 27th the storm was over southern Minnesota and southeast and southwest storm warnings were ordered over the balance of the upper Lakes and also at Detroit and Toledo. At 3 p. m. of the 27th warnings were continued over western Lake Superior and at Escanaba, and at 10 p. m. southwest warnings were ordered for the balance of the lower Lakes. The storm at this time was central over Lake Michigan, with slightly increased intensity and was moving eastward. High winds characterized the progress of this storm, except over the eastern lower Lake region and the Atlantic coast. After reaching the lower Lake region the storm diminished in intensity and passed off the New England coast during the 30th only as a moderate depression. The highest winds of the storm were experienced on western Lake Superior, Duluth reporting a maximum velocity of 60 miles per hour from the northeast during the night of June 26-27; over the remaining portions of the Lakes the winds were not nearly so high.

Small-craft warnings were also occasionally ordered during the month on the Lakes, but their display was without any features of interest.

Frost warnings were ordered on the 1st, 5th, 6th, 10th, 15th, 16th, 19th, and 20th. The frost warnings on the 1st were ordered for the cranberry districts of Wisconsin, there being at the time a cold high-pressure area central over Minnesota and eastern South Dakota. Warnings for the 5th were widely scattered. The high-pressure area that had moved southward from the Hudson Bay country following a storm from the west was accompanied by a decided fall in temperature, and on the morning of the 5th frost warnings were ordered for the Cape Cod cranberry districts. At the same time pressure was rising rapidly in the North Pacific States following a low area that at the time was over the Canadian Northwest, and frost warnings were ordered for eastern Oregon, southern Idaho, western Montana, and northwestern Wyoming. On the following morning heavy frost occurred in portions of Idaho, but over the remaining sections for which frost had been forecast none occurred on account of the per-

sistence of cloudy weather with rains. On the 10th the increased pressure over the northern Plateau indicated frost in that section for the following morning, and warnings were accordingly ordered, but here again clouds intervened and prevented the formation of the frost. On the 15th strong high pressure over South Dakota again necessitated warnings for the cranberry marshes of Wisconsin and frost occurred on the following morning over southern Wisconsin and upper Michigan. The frosts in Michigan had not been anticipated, but they were so light that no damage was caused. As this high area continued to move eastward, frost warnings were ordered on the 16th for northern New England, the interior of Massachusetts and New York, the cranberry marshes of New Jersey, and the mountain districts of Maryland and Virginia. These forecasts were not generally verified although frost occurred in scattered localities. On the 19th a high area from Manitoba moving southward, following a depression over the upper Mississippi Valley and the Lake region, indicated quite low temperatures for the following morning over the upper Lakes, and frost warnings were accordingly issued for the general frosts that occurred on the morning of the 20th. Frost warnings were also issued on the 20th for the cranberry districts of New England and New Jersey and for the interior of New England and New York, but they failed of verification on account of the rapid movement of a disturbance from the west.

There were several special weather features during the month. The first was the cold wave with attendant low pressure that prevailed over the districts west of the Rocky Mountains from the 2d to the 8th, inclusive. During this time pressure remained steadily low with temperatures in some localities as much as 30° below the seasonal average. Snow occurred on the morning of the 5th in northern Nevada and on the morning of the 6th in northern Utah. Freezing temperatures occurred quite generally during the week and it was not until after the morning of the 9th that the temperatures rose with clearing weather and the approach of a high-pressure area from the North Pacific coast. The second unusual feature was the heavy rainfall over the greater portion of South Dakota during the first two weeks of the month. During this time the Weather Bureau station at Huron, S. Dak., reported 11.30 inches of rain. The third feature was the occurrence of a severe drouth for the first three weeks of the month over the interior districts south of the Ohio River and in Maryland and Virginia. During the fourth week, however, a storm period set in, bringing with it frequent and abundant rains over Maryland, the District of Columbia, Virginia, and portions of West Virginia. Over the remainder of the dry area, however, the rains were not of much consequence. The fourth feature of the month's weather was the occurrence and persistence of a hot wave over the central, southern, and southwestern portions of the country. The hot wave in the South was practically continuous after the 6th of the month, except for a few days during the second decade, and many records for the month were equaled or exceeded over the central portion of the country. There was a hot wave from the 6th to the 11th, inclusive, and another from the 14th to the 27th, inclusive, over the central portion of the country during which time records

were equaled or exceeded. Over the eastern districts the hot waves were not so prolonged, but there were two well-marked periods from the 10th-12th, and another from the 23d-26th, both inclusive, during which records were also equaled and exceeded in southern Virginia.

#### NORTHERN HEMISPHERE PRESSURE DISTRIBUTION.

Over the Aleutian Islands, as indicated by the reports from Dutch Harbor, low pressure prevailed during the first half of the month with a marked minimum on the 4th and quite well-marked depressions on the 14th and 16th. After this time pressure ruled high, although not decidedly so, except from the 27th to the 29th. Over Alaska there were the usual alternations of high and low pressures with neither predominating to any large extent. The greatest depression occurred at Nome on the 12th and the highest pressure on the 20th, also at Nome.

Over the United States west of the Rocky Mountains there was a low-pressure period lasting for nearly 10 days without any great storm movement. The low pressure was then followed by a period of high pressure, which prevailed quite generally until the end of the month, except between the 18th and 23d, when the barometer was moderately low. East of the Rocky Mountains there was a more regular alternation of high and low pressure areas, but with high pressure prevailing more uniformly over the southern districts, with a result that a hot wave prevailed during most of the month

south of the Ohio River. The storms were not of great magnitude, although the extreme northwestern depression of the 2d became a severe storm by the time it had reached the Newfoundland coast. Over the North Atlantic Ocean, as indicated by reports from Bermuda, Turks Island, and the Azores, high pressure ruled almost uniformly.

Over Iceland and the British Isles high pressure prevailed during the first half of the month and low pressure thereafter, as a rule, with a marked minimum over Iceland on the 26th. At Spitzbergen high pressure also prevailed throughout the month. Over continental Europe the pressure was quite low during the first week of the month and high thereafter, as a rule, except over southern Russia, where it was low throughout the month, except for one or two days about the middle of the month. Over Siberia the distribution was irregular, but with a tendency toward moderately high pressure during the first half of the month, and low pressure during the second half. The only decided depressions occurred at Tomsk on the 18th and at Irkutsk on the 19th and Nertchinsk on the 28th.

Over eastern China and Japan conditions were somewhat more regular with the usual alternations of moderately high and low pressure areas, except that quite low pressure ruled over Japan from the 5th to the 10th.

Over the North Pacific Ocean, as indicated by reports from Honolulu, pressure slightly below normal prevailed almost uniformly, except during the first five days of the month.